Leveling the Playing Field in Hawai'i's Native Forests

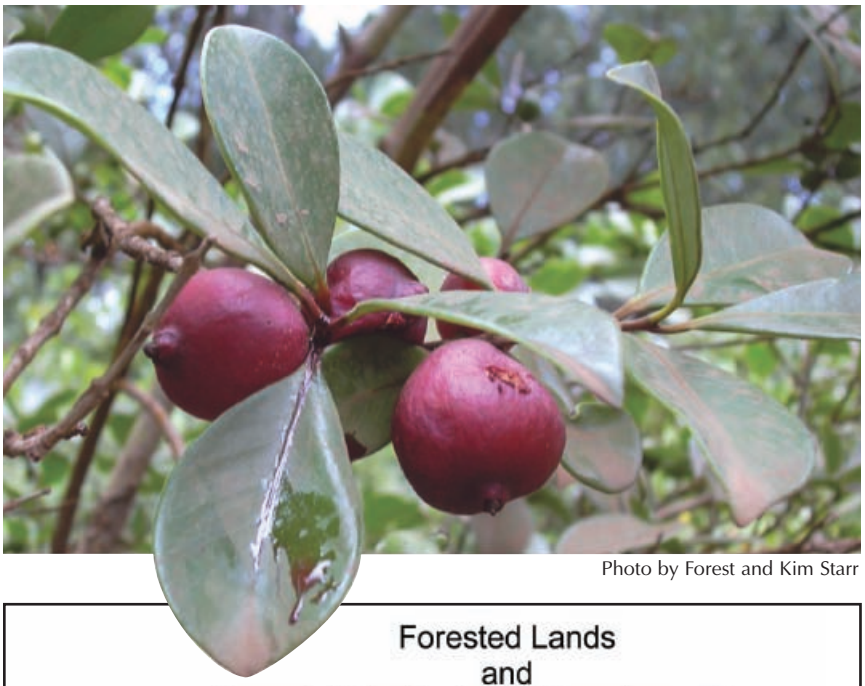
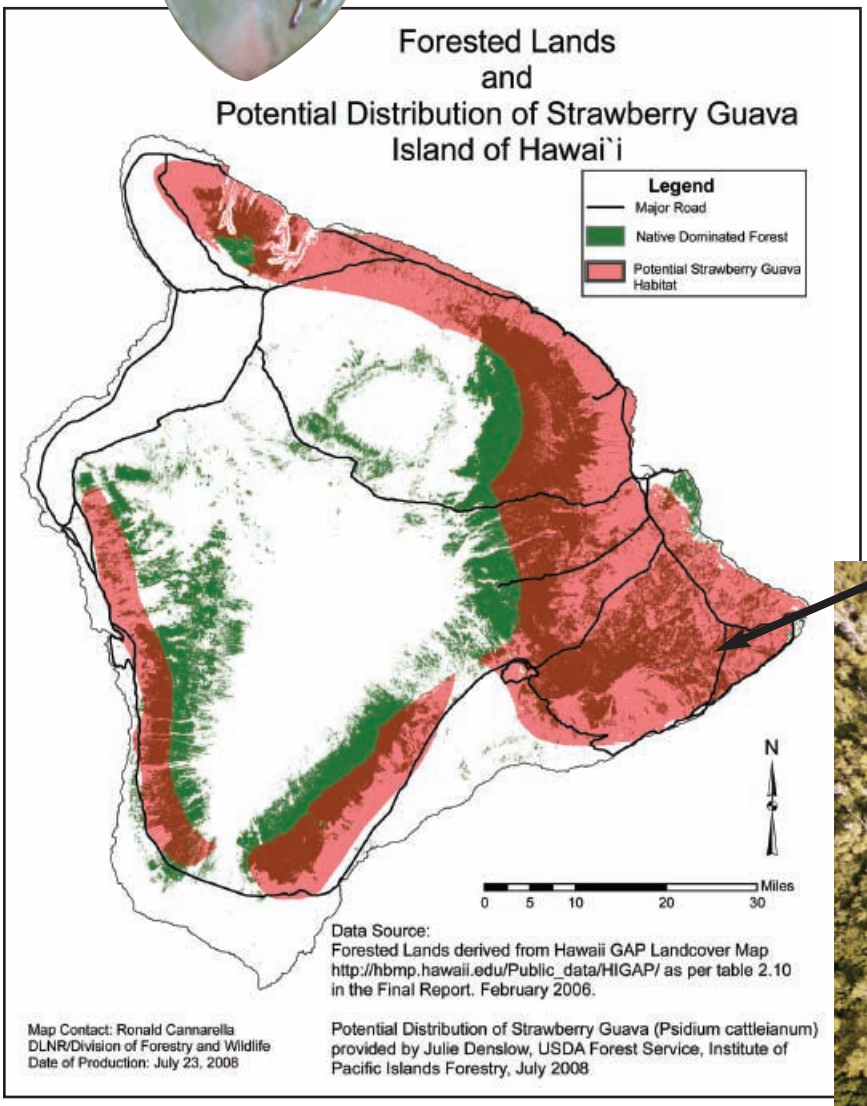


Photo by Forest and Kim Starr



Strawberry guava is a threat to 90% of remaining forested lands statewide.

CALL TO ACTION

Scientists with the U.S. Forest Service are preparing to release a Brazilian scale insect, *Tectococcus ovatus*, to help slow the spread of invasive strawberry guava *(Psidium cattleianum)*, also known as *waiawī*, in Hawai'i. Since its introduction in 1825 as an ornamental plant, strawberry guava has invaded Kaua'i, O'ahu, Moloka'i, Maui, Lāna'i, and Hawai'i, smothering our native forests, reducing the amount of water flowing to our aquifers, and spreading fruit flies to vulnerable crops.

There are no natural controls in Hawai'i for strawberry guava. With conventional management tools alone proving insufficient to contain it, strawberry guava has become one of the most serious threats to our quality of life in Hawai'i, affecting countless rare and endangered species, essential watersheds, the Native Hawaiian culture, our agricultural industry, as well as public access for subsistence gathering and recreation.

Can we continue to use strawberry guava while limiting the damage it is causing? Yes. Extensive tests conducted over 15 years in both Hawai'i and strawberry guava's native habitat, Brazil, indicate that we can safely and economically slow the vigorous growth of strawberry guava with the help of one of its native parasites, *T. ovatus*, without causing harm to other species, or threatening our valuable food crops.

Strawberry guava (dark green vegetation) taking over 'ōhi'a lehua and other native trees at Wao Kele O Puna. Photo by G. Asner

What Price Waiawī? – The Cost of Inaction

Nathan Yuen

Fresh Water

Adapted over millennia to Hawai‘i’s wet and dry seasons, the multi-layered sponge-like Hawaiian rain forest is superior for capturing water. Forests invaded by strawberry guava send nearly a third less water to our aquifers than diverse native forests, significantly reducing the amount of freshwater available to us.

“Water loss from the invaded strawberry guava forest in Hawai‘i Volcanoes National Park is 27% higher than that from the native forest on average. This is a huge loss of water from our soils, streams, and groundwater systems.” Thomas Giambelluca, Professor, Dept. of Geography, University of Hawai‘i

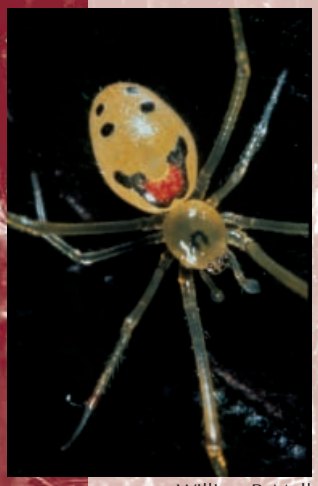
Jim Jacobi, U.S. Geological Survey

Rob Shallenberger

Native Plants & Animals

Strawberry guava engulfs everything in its path under a tangle of roots and sprouting trunks that steal light, water, and nutrients from native plants and destroy habitat for native birds and invertebrates. At current pace, it could replace entire native ecosystems and endangered species habitat.

“On Lāna‘i, strawberry guava density is so great, the soil is root-packed, nothing can move between the trunks, and there is no room for the endangered ‘ua‘u (Hawaiian petrels) to build their nests.” Fern Duvall, Wildlife Biologists, DLNR Division of Forestry and Wildlife, Maui Moloka‘i, and Lāna‘i

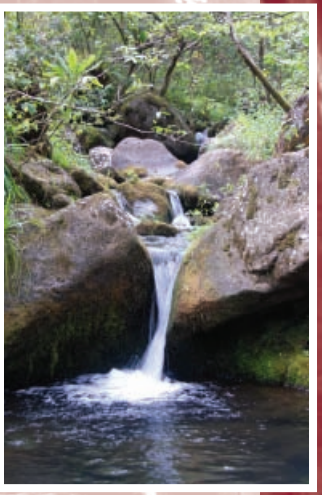


William P. Mull

Water Quality

Strawberry guava crowds out the understory plants that protect our soils, increasing soil erosion and runoff into our streams, nearshore waters, and coral reefs. This affects the food people gather from streams and the ocean, and threatens public health and safety.

“We are concerned about anything that increases erosion and runoff from our forests. We have to deal with the effects of this. We are the ones in the water, gathering food from our streams and the ocean, and working to safeguard water quality for everyone.” Maka‘ala Ka‘aumoana, Executive Director, Hanalei Watershed Hui



Kawika Winter

Victoria Martocci

Public Access

Dense thickets of strawberry guava are impossible to penetrate, blocking access to the native forests and popular trails for hikers, hunters, birders, and subsistence gatherers. Strawberry guava thickets also make it more difficult and expensive to create and maintain trails and recreation areas.

Forest and Kim Starr

Hawaiian Culture

Forest and Kim Starr

With each loss of a native plant or animal, we lose a part of our Native Hawaiian cultural heritage for future generations. Whether plants for lei and medicines, traditional woods for hula and tools, or forest birds and other ʻaumākua, strawberry guava destroys the integrity of our homeland.

"Many native species that once supported the Native Hawaiian culture, such as kauila and uhiuhi from the dry forest, are now endangered. Controlling strawberry guava in the native rain forest is about preventing additional harm to our culture." Julie Leialoha, President, Conservation Council for Hawaiʻi

"Waiawī has some uses, but it is literally crowding our native forest out of existence. Our precious native trees are the true kūpuna of these islands. If these species are lost, we also lose many of the traditions left by our ancestors, along with our ability to pass them down to our keiki and moʻopuna." Kawika Winter, Director, Limahuli Garden and Preserve, NTBG

Courtesy of DLNR

Courtesy of MAʻO Organic Farms

Diversified Agriculture

Hawaiʻi's agricultural industry loses millions of dollars annually to fruit flies. These pests use strawberry guava as a primary host. Rotting fruit in our forests generates swarms of flies that invade our agricultural lands. Limiting the number of wild strawberry guava trees would allow us to grow and export more produce.

"Working with farmers on the Hawaiʻi Fruit Fly Area-Wide Pest Management Program, consistently, with almost every crop we looked at — papaya, mango, cherimoya, and lychee, for example — the number-one problem was the impact of strawberry guava." Roger Vargas, Research Entomologist, U.S. Department of Agriculture

Forest and Kim Starr

Richard Palmer

"Native forests displaced by strawberry guava lose their appeal to visitors and residents when native plants and animals are pushed out by stands of this one invasive tree." Annette Kaʻohelauliʻi, President, Hawaiʻi Ecotourism Association

Courtesy of MAʻO Organic Farms

Food Security

Declining water reserves in strawberry guava forests mean less water for our farmers. Fruit flies from strawberry guava also limit what we can grow, attacking more than 400 varieties of fruits and vegetables.

"The explosion of strawberry guava will result in more fruit flies and less water for our farmers, who are trying to meet growing demands to produce more food for local consumption. To save our native forest from strawberry guava and wild pigs — which feed on strawberry guava and spread its seeds — we encourage the raising of pigs in farming areas, like the early Hawaiians did." Charles Peʻapeʻa Makawalu Burrows, President, ʻĀhahui Mālama I Ka Lōkahi – Native Hawaiians for the Protection of Native Hawaiian Species

Biocontrol Myth Busters

- ***Hawai'i's failure with the mongoose shows that biological control is unreliable.*** The mongoose was introduced by a sugar planter in 1883 with no scientific testing or regulatory oversight. Today, we require rigorous testing. Since 1975, 51 biocontrol species (including natural enemies for clidemia, banana poka, and ivy gourd) have been introduced to Hawai'i with no negative effects A biocontrol for the wiliwili gall wasp is currently being tested. A mistake made a century ago has long since been trumped by a decades long track record of success.

- **Tectococcus ovatus *could target other wild plants or crops.*** In Brazil, *T. ovatus* has never been found on any agricultural crops, only strawberry guava and one other wild plant, which is not found in Hawai'i. Likewise, researchers in Hawai'i tested *T. ovatus* on some 80 related native, commercial, and ornamental species. They confirmed that it only feeds on its host, strawberry guava.

- **T. ovatus *will rob our community of a source of food and wood.*** *T. ovatus* will not kill strawberry guava, taint its fruit, or affect its wood. It will simply slow its fruit production and spread. People will still be able to pick fruit and gather the wood, as Brazilians continue to do in their forests where the trees are preyed upon by a far greater multitude of insects. Horticultural oils used to control other scale insects can be used to protect homegrown trees if necessary.

- ***Populations of native birds and other animals that depend on strawberry guava will decline.*** Strawberry guava is one of the greatest threats to native Hawaiian forest birds. It displaces native plants that feed and shelter native birds, and invades their essential foraging and nesting habitat. Some non-native animals, such as birds and wild pigs, eat strawberry guava and spread this invasive species, but none is dependent on strawberry guava for its survival.

- ***If we control strawberry guava manually or chemically, we will not need biocontrol.*** Strawberry guava infests hundreds of thousands of acres across our state. It produces billions of seeds annually and spreads at exponential pace – often into steep or remote terrain, making manual or chemical clearing dangerous and a temporary measure at best. After decades of effort, it has become clear that biocontrol, used alone or with other methods, is our best and most economical option.

- ***Biocontrol of strawberry guava will clear large forested areas, causing erosion and encouraging other invasive plants to move in.*** *T. ovatus* will not kill strawberry guava, but impact stands of guava gradually, allowing more native species to grow back and helping native forests to regenerate. Dense stands of strawberry guava are more likely to cause erosion, as they crowd out the understory plants that protect our soil, causing runoff and sedimentation of our streams and nearshore waters.

- ***We should let strawberry guava grow because it could become valuable commercially as a biofuel.*** Strawberry guava has not been identified as a potential biofuel in any serious commercial proposal in Hawai'i. The areas where we most want to control its growth would be difficult if not impossible to access for commercial purposes. Even with *T. ovatus,* there will be more than enough wood for any conceivable use well into the future.

"If we don't slow down strawberry guava, koa will be depleted to the point that racing a koa canoe will become a "remember when" story." Art Medeiros, Coordinator, Leeward Haleakalā Watershed Restoration Partnership

'Aumakua (guardian spirit) of Hawaiian canoe-builders, the 'elepaio depends on healthy and diverse native forests for its survival.

Photo by Jack Jeffrey

CALL TO ACTION

1. **Contact your elected officials and let them know you support the proposal to use *Tectococcus ovatus* to control strawberry guava**
2. **Write a letter to the editor**
3. **Attend public meetings scheduled in 2009 in each county**
4. **Review and comment on the revised Draft Environmental Assessment by the U.S. Forest Service in 2009. Notice will appear in *The Environmental Notice*: www.hawaii.gov/health/environmental/oeqc/index.html/**

For more information

U.S. Forest Service:
www.fs.fed.us/psw/topics/biocontrol/strawberryguava/

Hawai'i Invasive Species Council:
www.hawaiiinvasivespecies.org

Hawai'i Conservation Alliance:
www.hawaiiconservation.org/strawberryguava.asp

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